GREEN & ENVIRONMENTAL AUDIT REPORT

of

Gram Vikas Mandal's

KRANTIVEER NAVALBHAU ART'S COLLEGE, NAVALNAGAR, TAL. & DIST. DHULE (MS)

(February 2022)

Prepared by

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To,

The principal
Gram Vikas Mandal's Krantiveer Navalbhau Art's College,
Navalnagar, Tal. & Dist. Dhule (MS)

Green Audit Report of Krantiveer Navalbhau Art's College, Navalnagar, Tal. & Dist. Dhule (Ms) has been prepared by Nature Adobe System based on survey of the college campus, checking records and interactions with Teaching, Non-Teaching staff and students.

The audit was conducted on **10/02/2022**. The green audit report presents green initiatives taken up by the institution and provides suggestions and recommendations to improve environmental sustainability.

The data prepared for the Gram Vikas Mandal's Krantiveer Navalbhau Art's College Will be a useful tool to maintain campus greenery, resource management, planning of future projects, and a document for implementation of sustainable development of the college. Existing data will allow the college to identify areas in need of improvement and prioritize the implementation of future projects.

We expect that the management will be committed to implement the green audit recommendations. We are happy to submit this green audit report to the Gram Vikas Mandal's Krantiveer Navalbhau Art's College authorities.

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1. About the College

The Gram Vikas Mandal's Krantiveer Navalbhau Art's College, Navalnagar, Tal. & Dist. Dhule was established on **21 June 1993**. College is a profound educational institute offering secondary and tertiary education since the last 30 years to rural and tribal students of this region. Gram Vikas Mandal's Krantiveer Navalbhau Art's College, Navalnagar, Tal. & Dist. Dhule Maharashtra is in the rural and tribal area of Maharashtra. The college is affiliated to Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon (Maharashtra)

2. Introduction

The objective of the green audit is to assess environmental activities on and off Institute that have an impact on the campus's eco-friendly ambiance. Green audit is described as the systematic identification, quantification, recording, reporting, and analysis of environmental components of an institution. Environment pollution, improper use of resources, poor waste management, climate change, deterioration of ecosystems, and extinction of species. This has prompted organizations to adopt a systematic approach to environmental management through the implementation of environmental management systems. The goal of a green audit is to find out how its practices affect the environment. As part of this practice, an internal audit is done to see how things really are on campus. Because of this, it is important for the institute to adopt the Green Campus system.

On **10 February 2022**, an Environmental Auditor and team from Nature Adobe System inspected the college as part of a Green Audit. Before the Audit, the team compiled a series of questions and a list of items. During the audit, the team went to every part of the college campus, including classrooms, the library, bathrooms, the seminar hall, staff rooms, the administration office, departments, etc. The institute was running normally during the audit.

The Green Auditor Team came to the location.

3. Methodology for Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a systematic process to identify, predict and evaluate the environmental effects of proposed actions to aid decision making regarding the significant environmental consequences of project on environment.

To perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation, and review of the greenery, interviewing key persons and recommendations. It works on the several levels of 'Green Campus' includes Water Conservation, Water management, Energy Conservation, Tree Plantation & Waste Management, E-waste management, Green area management, Paperless Work etc. The specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability. It can make a tremendous impact on student health and learning environment.

4. Scope and Goals of Green Auditing

A clean and healthy atmosphere facilitates successful learning and provides a setting conducive to learning. There are numerous initiatives worldwide to address environmental education concerns. Green Audit is the most eco-friendly and effective method for addressing environmental issues. It is a form of professional care for which all economic, financial, social, and environmental stakeholders are responsible. It is vital to conduct green audits on college campuses so that students are made aware of green audits and their benefits in preserving the environment, and so that they develop into responsible members of society. Thus, Green audit becomes essential for colleges. The anticipated result of an environmental management system consists of

1. Enhancement of environmental performance.
2. Fulfilment of compliance obligation.
3. Achievement of environmental objectives.

5. Location for Green Audit

Gram Vikas Mandal's Krantiveer Navalbhau Art's College , Navalnagar, Tal.& Dist. Dhule(MS). Total build up area of campus is 924.42 sq m. The approach road is busy as it's a side by highway and there is not considerable traffic.

The land use of the area is mainly Agricultural.

Geographical location of Vidyadhan College

6. Green Audit Procedural Steps

The Green Audit Procedural Steps covered 14 major areas, which were further divided into subareas. The compliance was checked in following areas and assessment is done by using different assessment tools, like Visual inspection, Questionnaires, Check list.

a. Day light Design and Ventilation
b. Water Efficiency
c. Rainwater Harvesting
d. Indoor Air Quality
e. Energy Efficiency
f. Temperature and Acoustic Control
g. Wastewater Management
h. Paper Waste Management
i. E-Waste Management
j. Solid Waste Management
k. Liquid Waste Management
l. Universal Access and Efficient Operation and Maintenance of Building
m. Green Belt
n. Botanical Garden
o. Green Programs (Green initiatives)

a. Day light Design and Ventilation

Well ventilated classrooms with wide doors and large windows.

- Corridors are wide with high ceiling.
- Light colored curtains are provided on the windows to avoid glare, but it allows the sunlight.

- LED tube lights are provided in the classrooms & corridors, which save electricity.
- Classrooms have fans, which help in ventilation.
- Washrooms have windows to disperse heat, fumes, and odors




b. Water Efficiency

The main source of water is well to the institute. Water used in institute for many purposes like drinking, flushing, and cleaning the toilets

Major observation during the audit is listed below:

o Each floor has drinking water facility.

o Water is used for toilet flushing.

o Water is used for floor cleaning.

o Wash basins are provided with well working conditions.

o No leaking faucets were seen anywhere.

If water leakage is observed, maintenance department is called immediately to attend to the complaints. o Rainwater harvesting, a sustainable source of water, is practiced.

C. Rainwater Harvesting

Rainwater harvesting facility is available for recharge of ground water. The college building design has provision for collection of rainwater. The building design includes PVC piping at various points. The rainwater is carried through the pipeline and discharged in the concealed underground well dug back side of the college building. The rainwater is discharged in big soak pit at the back side of the college building. It is filled of pebbles, stones and fully covered. The percolation rate of a recharge pit is much less than of an open well. The water percolates slowly because there is no hydrostatic pressure in the pit. The rainwater harvested thus helps to recharge the ground water. A ground water recharge pit allows the rainwater to replenish the bore well and groundwater by recharging the underground aquifers.

d. Indoor Air Quality

Indoor Air Quality (IAQ) refers to the air quality within and around buildings & structures, and it relates to the health and comfort of building occupants. Some common indoor pollutants are listed below:

1. Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
2. Carbon dioxide – Due to human respiration
3. Particulate matter – Due to construction and maintenance activities

It is observed that Institute has

a) Washrooms are without exhaust fan.

b) More Indoor plants are needed in the entire campus.

e. Energy Efficiency

The areas of major consumption of electricity are:

I. The total number of computers available in the college are 19

II. Tube lights-31, CFL-18 and fans -37are available as per requirement.

III. Xerox–2, Printer-2, Biometric-1, Scanner-1, OHP-1

1. The design of buildings assures maximum usage of natural light and air to save electricity.
2. Windows with curtains are provided in classrooms, faculty room, and seminar halls, which allow natural sunlight and in turn, leads to electricity conservation.
3. Classrooms are spacious and have large windows which allow all time fresh air to move in and out and thus it requires minimum electricity.

4. LED lights are provided in the campus which are eco-friendly and consume less energy. LED lights can save energy up to 75% and they are 25 times durable than incandescent lights.
5. The College is naturally ventilated building.
6. Institute ensure that there is no wastage of electricity as they keep check after classes/lectures are over and office hours end.
7. Use signage encouraging users to switch off light and fans to save electricity.

f. Temperature and Acoustic Control

It is observed that Institute has

1. White-washed rooms & passages improve the lighting conditions.
2. Acoustic control walls are provided in seminar hall and meeting rooms, which are designed to minimize the exposure to sound

g. Wastewater Management

Major observations under wastewater management are listed below:

3. Sanitary wastewater generated from washrooms is connected to the sewerage system.
4. Wastewater generated from staff rooms is also connected to the sewerage system.

h. Paper Waste Management

The institution has taken steps to minimize and avoid paper usage because, waste paper is the main solid waste generated in the premises of institution.

It was observed that:

6. Many official processes such as sanctioning the leave, accounting etc. are made paper less and use of technology is promoted. As per the policy of Government of Maharashtra
7. All communication with all departments and internal notices are majorly through E mail & SMS.
8. Prints and photocopies are taken on both sides of the pages to avoid excess paper usage.
9. Important paper notices are displayed on the notice boards as well as communicated through bulk sms services available in our institution, all students and faculty members are informed through it.
10. Library using Microsoft software. Library database gives detailed information about library books. It is help to reduce paper waste.

i. E-Waste Management

It was observed that:

1. E- Waste is collected and resold to the retailers who contact the college and thus the college ensures recycling.

j. Solid Waste Management

It was observed that:

11. The combined waste is directly handed over to natural dumping method.
12. The biodegradable waste is subjected to processing by vermi-composting.
13. Students, teaching staff, and non-teaching staff all participate in the Swachh Bharat Abhiyan.
14. Separate bins are not provided for wet biodegradable and dry recyclable waste.

k. Liquid Waste Management

16. Dripping and leaking taps are repaired time to time for effective use of water.
17. Processed water is used for garden and maintenance of campus area.

l. Universal Access and Efficient Operation and Maintenance of Building

- Ramp facility is available for differently abled individuals
- Since the access and staircases are wide and free from clutter, it is possible to have a safe evacuation in case of emergency.
- There are wide windows
- Fire extinguishers (3) are provided for emergency.

m . Green Belt

The College has a wide campus, there is much space available for landscaping other than for plants near compound walls. The faculty and the student proactively worked in the Swachh Bharat Abhiyan. Students organized clean campus drive etc.

Green Campus: The campus is partially green. The campus is surrounded by evergreen trees. A special staff is recruited for the maintenance of the garden.

n. Botanical Garden

Institute has a Botanical Garden.

Local Flora is recorded in the Botanical Garden.

6. Green Programs (Green initiatives)

Plastic Free Campus: use of plastic is prohibited in the campus. Accordingly, the college has undertaken several green initiatives and the campus is declared as Plastic free campus.

The college tries to educate the students through the counselling to prevent the use of plastic. The students willingly participate in "No to Plastic" campaign.

Use of Bicycle: Nowadays, environmental consciousness is growing among the students. As a result, there are increasing numbers of students and staff members who prefer using bicycles.

Pedestrian friendly roads - Students, staff were using pedestrian road.

National Service Scheme (NSS) - National Service Scheme aims to include social welfare in students and to provide service to society without bias. NSS volunteers take care of blood donation camp, cleanliness, health awareness issues and any other activities.

1. The NSS unit of the college initiated a village adaption initiative.
2. Tree plantation programs were carried out by staff & students every year.
3. Under NSS, students have participated in 'Swachh Bharat Abhiyaan'

   , cleanliness programs at campus area and village area.
4. Students actively take part in bus stand cleaning as well as public places cleaning activities.
5. NSS conduct Student rallies for awareness about cleanliness in public.

7. Recommendations/ Suggestions

1. For Improving Energy Consumption:

1. Every classroom and lab with central switch board should have a diagram linking place of tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
2. Conduct awareness program for students and staff for energy conservation.
3. Notices/signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electricals when not in use

2. Water Conservation:

1. In campus small scale/medium scale/large scale reuse and recycle of water system is necessary
2. Reduce water usage by installing water saving faucets such as tap aerators, dual flushing system in toilets etc.
3. Installation of waterless urinals can be considered to reduce water consumption.

4. Encourage efficient water use Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
5. Wastewater is conserved and recycled by filtration process.

3. Paper and other Solid Waste Reduction:

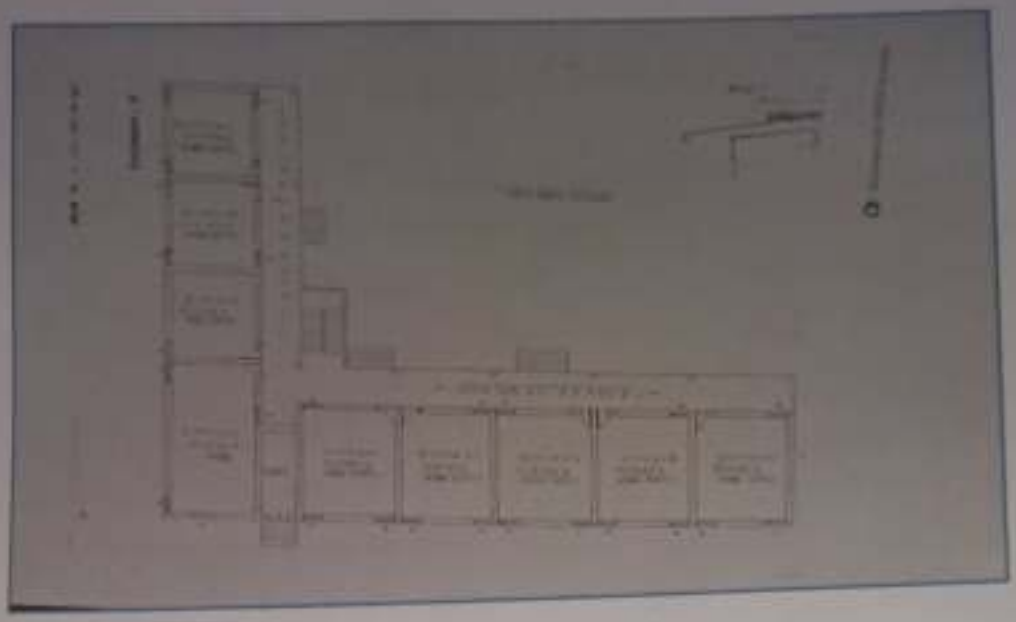
1. Solid waste generated in the premises must be maintained by awareness in students, staff (Teaching and non-teaching).
2. Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other material to needy students. This can be an initiative under green program.
3. Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste
4. Biodegradable waste from canteen can be used for composting.

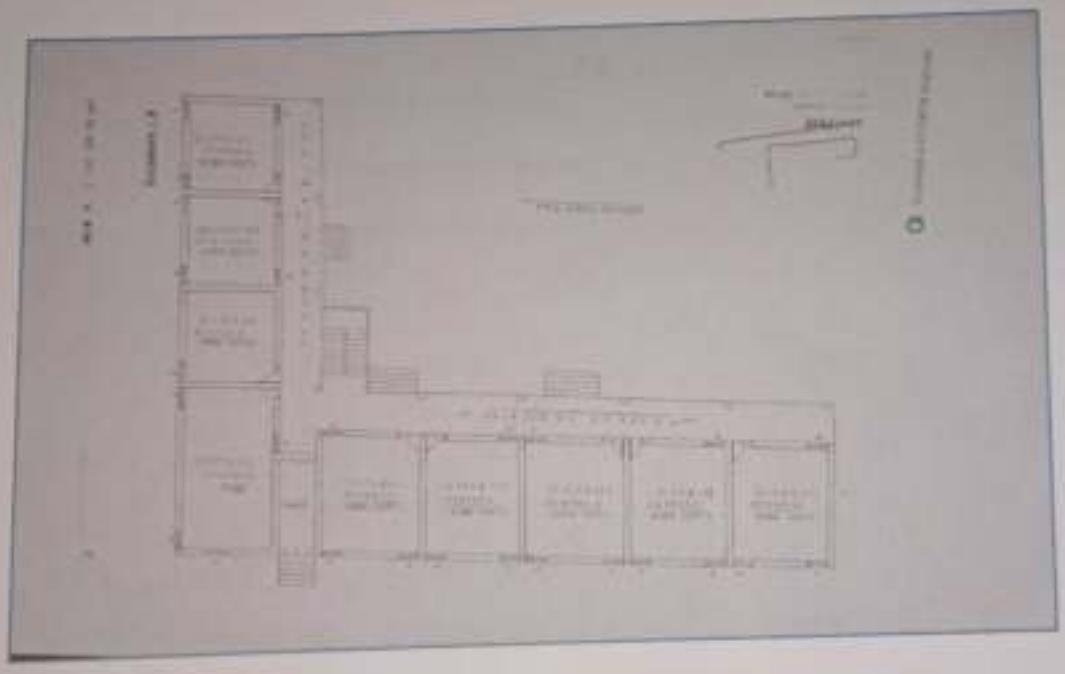
4. Others:

1. Environmental advisory committee could be formed.
2. Promote environmental awareness as a part of course work in various curricular areas.
3. Implement research projects, and community service.
4. Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.
5. Small Bio-gas project can be provided for canteen to treat the biodegradable waste.
6. Ensure that an audit is conducted annually, and action is taken based on audit report, recommendation, and findings.
7. Establish a College Environmental Committee that will hold responsibility for the Enactment, enforcement, and review of the Environmental Policy.
8. Celebrate every year 5th June as 'Environment Day' and plant trees on this day to make the campus Greener.

Annexure

1. **Institute Layout**





2.List of Botanical Garden Plants

SN	Plant Name
1.	*Tecoma stans*
2.	*Mosmon longifolium*
3.	*Hibiscus rosa-sinensis*
4.	*Jasminum sambac*
5.	*Kalanchoe pinnata*
6.	*Duranta erecta*
7.	*Cordia sebestena*
8.	*Tamarindus indica*
9.	*Pongamia Pinnata*
10.	*Rodermachera sinica*
11.	*Moringa oleiferalom*
12.	*Millingfonia horstensis*
13.	*Eucalyptus globulus*
14.	*Bambusa vulgaris*
15.	*Tectona grandis*
16.	*Madhuca longifolia*
17.	*Leucaena leucocephala*
18.	*Bougainvillea- glabra*
19.	*Plumeria pudica*
20	*Plumeria alba*
21.	*Colliandra tergemina*

22. *Conocarpus gossweileri*

23. *Ficus religiosa*

24. *Azadirachta indica*

25. *Syzygium cumini*

26. *Diospyros virginiana*

27. *Ficus benghalensis*

28. *Ficus racemosa*

2. Green Audi Questionnaire

Which of the following are available in your institute?

1	Garden area	Yes
2	Playground	Yes
4	Toilets	Yes
5	Garbage Or Waste Store	Yes
6	Library	Yes
7	Canteen	No

Which of the following are found near your institute?

1	Municipal dump yard	Not in vicinity of institute
2	Garbage heap	No Garbage heaps
4	Public convenience	public convenience is available but so far
6	Stagnant water	No stagnant water
7	Open drainage	No
	Industry – (Mention the type)	No
8	Bus / Railway station	Faraway from campus
9	Market / Shopping complex / Public halls	Not Close

Green Audit Checklist

Daylight & Ventilation

Sr. No.	Design Feature	Status	Remarks (If any)
1	Broad door opening	√	
2	High windows	√	
3	Rectangular building so that sunlight can reach all areas	√	
4	Light colored fabric curtain	√	
5	Use of glass as facilitator of natural light	√	
6	High ceiling	√	
7	Wide corridors	√	
8	Use of exhaust fans	x	

Water Efficiency & Wastewater Management

Sr. No.	Design Feature	Status	Remarks (If any)
1	Aerators to water taps	X	
2	Automatic toilet faucets	X	
3	Display of signboards at appropriate places for water conservation	X	
4	Water conservation	√	

Energy Efficiency and On-site Energy Generation Mechanism

Sr. No.	Design Feature	Status	Remarks (If any)
1	Use of natural day light	√	
2	Use of energy efficient equipment	√	
3	Use of energy saving bulbs (LED lights)	√	
4	Use of very low ozone depleting refrigerants	x	
5	On-site energy generation (Solar Panel Installed)	x	
6	Regular maintenance of electrical system	√	

7	Computerized monitoring of electrical system	x	
8	Solar panel	x	

Temperature and Acoustic Control

Sr. No.	Design Feature	Status	Remarks (If any)
1	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)	√	
2	Special walls for temperature control and noise barrier (Thick/ Double/ Composite/ Acoustic control)	X	
3	Roof with reflective glass	X	
4	Use of cool roofing material during construction (mineral wool, rock wool, vermiculite, foams, expanded polystyrene, extruded polystyrene etc.)	X	

Waste Management

Sr. No.	Design Feature	Status	Remarks (If any)
1	Segregation of dry and wet waste	√	
2	Use of colored bins with code to collect garbage	X	
3	Setting up recycling area/ composing area	X	
4	Avoid use of paper by going digital (Paper)	√	
5	Printing on both sides of paper	√	
6	Reuse of printed paper/ envelops for other applications	√	
7	Donation of computers to NGO's to refurbish and give it to needy schools/people	X	
8	Creation of specified junctions for collection of E- waste(E-waste)	X	
9	Reusing waste to produce new sustainable products	X	

Sr. No	Design Feature	Status	Remarks (If any)
1	Easy access to the main entrance of the building	√	
2	Provision of Lift/Elevators	X	
3	Ramp/ stairs with handrails on at least one side	√	Ramps available
4	Restrooms (toilets) in common areas	√	
5	Uniformity in floor level	√	
6	Follow standard procedures for commissioning of electrical/plumbing system	√	
7	Regular maintenance of building	√	
8	Use of chemical free products for cleaning	√	
9	Purchase of standardized and quality material for repair √		
10	Visual warning signage in common and exterior areas	√	
10	Hand over to the organization or recycler who knows proper disposal system	√	

Universal Access and Efficient Operation and Maintenance of Building

Green Program

Sr. No.	Design Feature	Status	Remarks (If any)
1	Green education to improve environmental awareness	√	
2	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	√	
3	Reduce, Reuse and recycle the products (At the time of de-selection and disposal of library material)	X	
4	Digitization of majority of processes	√	